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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,344	05/30/2006	Francois Conti	010-05-022	9059

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EXAMINER	
PILKINGTON, JAMES	
ART UNIT	PAPER NUMBER
3656	
MAIL DATE	DELIVERY MODE
08/03/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,344	CONTI, FRANCOIS	
	Examiner	Art Unit	
	JAMES PILKINGTON	3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 17-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 17-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The references cited in the Search Report EPO 9/1/04 have been considered, but will not be listed on any patent resulting from this application because they were not provided on a separate list in compliance with 37 CFR 1.98(a)(1). In order to have the references printed on such resulting patent, a separate listing, preferably on a PTO/SB/08A and 08B form, must be filed within the set period for reply to this Office action.

Claim Rejections - 35 USC § 112

Claims 1-15, 17-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the at least one moveable member" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 15, 19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosheim 6,038,940, in view of Kohli, USP 4,806,068.

Rosheim discloses a device for transmitting a movement, comprising:

- a moveable member (33) which is coupled to at least one parallel kinematics transmission structure (arms 20 and 30), each of the at least one parallel kinematics transmission structures comprising a control arm (20) pivotable over a rotation axis at one end and a linking bar (30) hingedly mounted on one end to the other end of the control arm (25h and 26p make the hinge) and the other end to the moveable member (33) and having at least two rotational degrees of freedom at the hinge connection (pivot of 25h and 26p and the pivot of 25h and 27 see Figure 3)
- a rotative actuator (motor connected to motor shafts 15' and 16' there is one for each arm, see C7/L1-25) coupled to each of the at least one parallel kinematics transmission structure (see Figure 2) over the control arm (20-20"') such that translational movement of the moveable member (33) is converted into rotational movement of a portion of the rotative actuator, or vice versa;
- wherein the rotative actuator (motors) is arranged such that its axis is substantially perpendicular to a rotation axis (along the axis of bevel gears 15" and 16", see Figure 2) of the control arm (20-20"')
- wherein the moveable member (33) is coupled to three parallel kinematics transmission structures (total of 4 arm arrangements shown) in a delta

type arrangement, wherein each parallel kinematics transmission structure is being coupled to a respective rotative actuator (each arm has its own motor, see C7-C8), wherein the rotative actuators (motors) are arranged such the their axes are substantially parallel to each other (the axes of each motor is the shaft that holds the bevel gears 15' and 16')

- wherein the rotative actuators (motors) are arranged on a common base member (inside 11) of the device
- the device is a haptic device for providing a user with force-feedback information (monitor arrangement 34-34''')
- the device comprising keys, control wheels, force grippers or other elements used for a human computer interface (34-34''')
- The device is a manipulator/measuring system for providing movements of at least three translational degrees of freedom to a manipulation member (33)

Rosheim does not disclose the connection between the linking bar and the moveable member has at least two rotational degrees of freedom.

Kohli teaches a connection between a linking bar (44) and a moveable member (20) which has at least two rotational degrees of freedom (ball and socket connection, 45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Rosheim and provide the connection between the linking bar and the moveable member has at least two rotational degrees of freedom, as taught

by Kohli, since substituting one hinge connection with another which has additional rotational degrees of freedom would yield the predictable result of increasing the number of degrees of freedom in the device.

Claims 4, 5 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosheim '940 in view of Kohli '068 and further in view of Salisbury, Jr., USP 5,046,375.

Rosheim discloses all of the claimed subject matter as applied above.

Rosheim does not discloses a cable member to transmit movements between the rotative actuator and the control arm, wherein the cable member is coupled to a shaft of the rotative actuator at one end and to the respective control arm at the other, wherein the shaft of the rotative actuator is adapted to enable secure coiling and uncoiling of the cable member, wherein the cable member is coupled at a fixation point of the control arm such as to allow the end of the cable to rotate with respect to the control arm, at least one redirection member for each control arm, wherein each redirection member is fixedly mounted on a base member of the device and located between the control arm and the shaft of the respective rotative actuator, wherein the redirection member is located a distance from the shaft of the respective rotative actuator such as to allow an appropriate incidence of the cable member on the shaft of the actuator.

Salisbury, Jr. discloses a cable member (19a) used to transmit movements between a rotative actuator (14) and a control arm (18), wherein the cable member

(19a) is coupled to a shaft (32a) of the rotative actuator (14) at one end and to the respective control arm at the other (coupled to the arm via additional cable assembly), wherein the shaft (32a) of the rotative actuator (14) is adapted to enable secure coiling and uncoiling of the cable member (19a, 32a is a spoil), wherein the cable member (19a) is coupled at a fixation point of the control arm such as to allow the end of the cable to rotate with respect to the control arm (the coupling of the cable 19c allows for rotation of 19a on 20a relative to arm 18), at least one redirection (20a) member for each control arm (18), wherein each redirection member (20a) is fixedly mounted on a base member (22) of the device and located between the control arm (18) and the shaft (32a) of the respective rotative actuator (14), wherein the redirection member is located a distance from the shaft of the respective rotative actuator such as to allow an appropriate incidence of the cable member on the shaft of the actuator (see Figure 2) for the purpose of providing a transmission system which is highly stiff, exhibits low frictional losses and has good fidelity of force transmission.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Rosheim and provide a cable member to transmit movements between the rotative actuator and the control arm, wherein the cable member is coupled to a shaft of the rotative actuator at one end and to the respective control arm at the other, wherein the shaft of the rotative actuator is adapted to enable secure coiling and uncoiling of the cable member, wherein the cable member is coupled at a fixation point of the control arm such as to allow the end of the cable to rotate with respect to the control arm, at least one redirection member for each control arm,

wherein each redirection member is fixedly mounted on a base member of the device and located between the control arm and the shaft of the respective rotative actuator, wherein the redirection member is located a distance from the shaft of the respective rotative actuator such as to allow an appropriate incidence of the cable member on the shaft of the actuator, as taught by Salisbury, Jr., for the purpose of providing a transmission system which is highly stiff, exhibits low frictional losses and has good fidelity of force transmission.

Claims 6 and 7, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosheim '940 in view of Kohli '068 and further in view of Arai

Rosheim discloses all of the claimed subject matter as applied to claim 1 above. Rosheim also discloses that the control arm and the linking bar of each parallel kinematics structure comprise articulations (the hinges are articulations which provide the rotational degrees of freedom).

Rosheim does not disclose that the articulations of the parallel kinematics transmission structure is a flexible hinge articulation and wherein at least two of the control arm, linking bar and flexible hinge articulation are made from one piece.

Arai teaches an articulation that can be used in a parallel kinematics transmission structure which is a flexible hinge (se Figure 1a and section 2.1) wherein the flexible hinge articulation and a control arm (left or right of center portion of the hinge in figure 1a is a control arm) are made from one piece.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Rosheim and provide of the articulations of the parallel kinematics transmission structure are flexible hinge articulations and wherein at least two of the control arm, linking bar and flexible hinge articulations are made from one piece, as taught by Arai, since substituting one hinge type for another would achieve the predictable result of allowing movement between the connected elements.

Claims 8, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosheim '940 in view of Kohli '068 and further in view of Hendzel, USP 6,412,844.

Rosheim discloses all of the claimed subject matter as applied above.

Rosheim does not disclose that the control arm is provided with a restoring element such as to provide a restoring force against the force exerted by the rotative actuator comprising a torsional spring arranged to bias the shaft of the rotative actuator and wherein the torsional force of the spring is such that the pre-stressing action of the restoring element is at least partly compensated.

Hendzel teaches robotic assembly with a control arm (48) is provided with a restoring element (54) such as to provide a restoring force against the force exerted by the driving element (biases control arm in retracted position) comprising a torsional spring (54) and wherein the torsional force of the spring is such that the pre-stressing action of the driving element is at least partly compensated (spring coils and uncoils to compensate) for the purpose of providing a biasing member to return the control member to a particular position (C3/L63-C4/L5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Rosheim and provide the control arm with a restoring element such as to provide a restoring force against the force exerted by the rotative actuator comprising a torsional spring arranged to bias the shaft of the rotative actuator and wherein the torsional force of the spring is such that the pre-stressing action of the restoring element is at least partly compensated, as taught by Hendzel, for the purpose of providing a biasing member to return the control member to a particular position.

Claims 17, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosheim '940 in view of Kohli '068 and further in view of Shahoian, US PGPub 2001/0000663.

Rosheim discloses all of the claimed subject matter as applied above.

Rosheim does not disclose a sensor for measuring the aperture angle of each control arm and a processor for calculating the position of the moveable member based on the results of the measurement, a wrist module arranged in series with the parallel transmission structure and adapted to provide at least one rotational degrees of freedom, wherein the wrist module is adapted to provide a tactile feedback and comprising a force sensor located underneath the wrist module.

Shahoian teaches a sensor for measuring the aperture angle of each control arm and a processor for calculating the position of the moveable member based on the results of the measurement (see paragraph 0036 and computer 16 which is the processor), a wrist module (34, 37 and 22) arranged in series with the parallel

transmission structure (the arm) and adapted to provide at least one rotational degrees of freedom, wherein the wrist module is adapted to provide a tactile feedback (see abstract, and paragraphs 7, 11, 13 and 45) and comprising a force sensor located underneath the wrist module (all sensors under the cover of 22/70) for the purpose of providing an improved user feedback system (see abstract and paragraph 11).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Rosheim with a sensor for measuring the aperture angle of each control arm and a processor for calculating the position of the moveable member based on the results of the measurement, a wrist module arranged in series with the parallel transmission structure and adapted to provide at least one rotational degrees of freedom, wherein the wrist module is adapted to provide a tactile feedback and comprising a force sensor located underneath the wrist module, as taught by Shanoian, for the purpose of providing an improved user feedback system.

Response to Arguments

Applicant's arguments with respect to claims 1-15 and 17-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES PILKINGTON whose telephone number is (571)272-5052. The examiner can normally be reached on Monday - Friday 7-3.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571)272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JAMES PILKINGTON/
Examiner, Art Unit 3656
7/27/09

/Richard WL Ridley/
Supervisory Patent Examiner, Art Unit 3656